

## CLAIMS

1. A pneumatic radial tire for a motorcycle including a tread portion, a pair of sidewall portions extending from edges of the tread portion inward in a radial direction of the tire, and bead portions continued to the side walls inward in the radial direction of the tire, provided with a carcass layer of at least one carcass ply having a cord at an angle in a range from 60 to 90 degrees with respect to an equatorial plane of the tire coated with a rubber material so as to make a reinforcement across bead cores embedded in the bead portions, and at least one layer of a steel spiral belt formed by spirally winding substantially in parallel with the equatorial plane of the tire outward of the carcass layer in the radial direction of the tire, wherein:

A flatness ratio ( $SH/TW$ ) of a height  $SH$  of cross section of the tire to a maximum width  $TW$  of a tread surface upon installation on a measurement rim specified by ETRTO under a no-load state at a post cure inflation in a vulcanizing process of the tire is set to be in a range from 0.50 to 0.85; and

a lateral out-plane bending rigidity ( $S_b$ ) and a peripheral in-plane bending rigidity ( $S_a$ ) among bending rigidities of the tread portion are set to be in ranges from 4.9 to 7.7 N/mm (500 to 790 g/mm), and from 5.1 to 7.8 N/mm

(520 to 800 g/mm), respectively, and a belt surface rigidity equilibrium value (K) expressed by a bending rigidity ratio ( $S_a/S_b$ ) of the peripheral in-plane bending rigidity ( $S_a$ ) to the lateral out-plane bending rigidity ( $S_b$ ) is set to be in a range from 0.90 to 1.10.

2. The pneumatic radial tire for a motorcycle according to claim 1, wherein a steel cord that forms the steel spiral belt comprises an open twisting cord with 1x2 structure having a filament diameter in a range from 0.12 to 0.40 mm.

3. The pneumatic radial tire for a motorcycle according to claim 2, wherein the belt surface rigidity equilibrium value (K) is in a range from 0.96 to 1.06.

4. The pneumatic radial tire for a motorcycle according to claim 1, wherein a steel cord that forms the steel spiral belt comprises an open twisting cord with 1x3 structure having a filament diameter in a range from 0.12 to 0.40 mm.

5. The pneumatic radial tire for a motorcycle according to claim 4, wherein the belt surface rigidity equilibrium value (K) is in a range from 0.98 to 1.08.

6. A pneumatic radial tire for a motorcycle including a tread portion, a pair of sidewall portions extending from edges of the tread portion inward in a radial direction of the tire, and bead portions continued to the side walls inward in the radial direction of the tire, provided with a carcass layer of at least one carcass ply having a cord at

an angle in a range from 60 to 90 degrees with respect to an equatorial plane of the tire coated with a rubber material so as to make a reinforcement across bead cores embedded in the bead portions, and at least one layer of a steel spiral belt formed by spirally winding substantially in parallel with the equatorial plane of the tire outward of the carcass layer in the radial direction of the tire, wherein:

A flatness ratio ( $SH/TW$ ) of a height  $SH$  of cross section of the tire to a maximum width  $TW$  of a tread surface upon installation on a measurement rim specified by ETRTO under a no-load state at a post cure inflation in a vulcanizing process of the tire is set to be in a range from 0.50 to 0.85; and

a steel cord that forms the steel spiral belt comprises an open twisting cord with 1x2 structure having a filament diameter set to be in a range from 0.12 to 0.40 mm.

7. The pneumatic radial tire for a motorcycle according to claim 6, wherein a count of the steel cord is in a range from 30 to 60 pieces/25 mm.

8. The pneumatic radial tire for a motorcycle according to claim 7, wherein a lateral out-plane bending rigidity ( $S_b$ ) and a peripheral in-plane bending rigidity ( $S_a$ ) among bending rigidities of the tread portion are set to be in ranges from 4.9 to 7.7 N/mm (500 to 790 g/mm), and from 5.1 to 7.8 N/mm (520 to 800 g/mm), respectively, and a belt

surface rigidity equilibrium value (K) expressed by a bending rigidity ratio ( $S_a/S_b$ ) of the peripheral in-plane bending rigidity ( $S_a$ ) to the lateral out-plane bending rigidity ( $S_b$ ) is set to be in a range from 0.96 to 1.06.

9. A pneumatic radial tire for a motorcycle including a tread portion, a pair of sidewall portions extending from edges of the tread portion inward in a radial direction of the tire, and bead portions continued to the side walls inward in the radial direction of the tire, provided with a carcass layer of at least one carcass layer having a cord at an angle in a range from 60 to 90 degrees with respect to an equatorial plane of the tire coated with a rubber material so as to make a reinforcement across bead cores embedded in the bead portions, and at least one layer of a steel spiral belt formed by spirally winding substantially in parallel with the equatorial plane of the tire outward of the carcass layer in the radial direction of the tire, wherein:

A flatness ratio ( $SH/TW$ ) of a height  $SH$  of cross section of the tire to a maximum width  $TW$  of a tread surface upon installation on a measurement rim specified by ETRTO under a no-load state at a post cure inflation in a vulcanizing process of the tire is set to be in a range from 0.50 to 0.85; and

A count of the steel cord of the steel spiral belt on an equatorial plane of the tire is in a range from 20 to 60

pieces/25 mm, and the steel cord diameter is in a range from 0.30 to 1.20 mm.

10. The pneumatic radial tire for a motorcycle according to claim 9, wherein the steel cord that forms the steel spiral belt comprises an open twisting cord with 1x2 structure having a filament diameter set to be in a range from 0.12 to 0.40 mm.

11. The pneumatic radial tire for a motorcycle according to claim 10, wherein a count of the steel cord is in a range from 30 to 60 pieces/25 mm.

12. The pneumatic radial tire for a motorcycle according to claim 9, wherein the steel cord that forms the steel spiral belt comprises an open twisting cord with 1x3 structure having a filament diameter set to be in a range from 0.12 to 0.40 mm.

13. The pneumatic radial tire for a motorcycle according to claim 12, wherein a count of the steel cord is in a range from 20 to 42 pieces/25 mm.

14. A method of mounting a pneumatic radial tire according to any one of claims 1 to 13 on a motorcycle, wherein different types of the steel spiral belts are selected to be combined to form a front wheel tire and a rear wheel tire.